AMENDMENTS IN THE CLAIMS:

1. (Currently amended) A data recording method for recording data as edge position information, including marks and spaces of multiple different lengths, on a storage medium by irradiating the storage medium with a pulsed energy beam, the method comprising the steps of:

(A) generating ~~a write code sequence~~ an NRZI data based on the data to be recorded;

(B) determining a write pulse waveform, defining the power modulation of the energy beam, according to the code lengths of respective codes included in the ~~write code sequence~~ NRZI data; and

(C) modulating the power of the energy beam based on the write pulse waveform,

wherein if the shortest code length of the ~~write code sequence~~ NRZI data is n (which is an integer equal to or greater than one), the step (B) includes assigning a write pulse waveform that has only one write pulse to recording mark making periods corresponding to codes with code lengths x of n, n+1 and n+2, and a write pulse waveform that has multiple write pulses Pw to recording mark making periods corresponding to codes with code lengths x of n+3 or more, respectively.

2. (Currently amended) The data recording method of claim 1, wherein if the shortest code length of the ~~write code sequence~~ NRZI

data is n (which is an integer equal to or greater than one), the step (B) includes classifying the code lengths x into at least four lengths including n, n+1, n+2 and n+3 or more, and

wherein as to two codes, which have code lengths m and m+1, respectively, and which have the same number of write pulses Pw in the recording mark making period of their write pulse waveforms, the step (B) includes determining the write pulse waveforms so as to satisfy the inequality:

(write pulse width of code length m) ≦ (write pulse width of code length m+1)

where the "write pulse width of code length m" is the width of an arbitrary Kth write pulse period included in the recording mark making period corresponding to the code length m and the "write pulse width of code length m+1" is the width of the Kth write pulse period included in the recording mark making period corresponding to the code length m+1.

3. (Original) The data recording method of claim 1, wherein as to two codes, which have code lengths m and m+1, respectively, and which have the same number of write pulses Pw and the same number of periods with a bottom power level Pb between two write pulses Pw in the recording mark making period of their write pulse waveforms, the step (B) includes determining the write pulse waveforms so as to

satisfy the inequality:

(pulse width of code length m)≦(pulse width of code length m+1)

where the "pulse width of code length m" is the width of an arbitrary Kth period with the bottom power level Pb included in the recording mark making period corresponding to the code length m and the "pulse width of code length m+1" is the width of the Kth period with the bottom power level Pb included in the recording mark making period corresponding to the code length m+1.

4. (Original) The data recording method of claim 1, wherein the write pulse waveform in the recording mark making period corresponding to codes with code lengths x of n+3 or more includes write pulses, of which the number is equal to the quotient obtained by dividing (x-1) by two.

5. (Original) The data recording method of claim 1, wherein in the recording mark making period corresponding to codes with code lengths x of n+3 or more, the length of a period in which the write pulse waveform has an erasure power level Pe is set to be at least equal to 1 Tw.

6. (Currently amended) The data recording method of ~~one of claims 1 to 5~~ claim 1, wherein in each said recording mark making

period, the length of a period in which the write pulse waveform has the bottom power level Pb is set to be at least equal to 1 Tw.

7. (Currently amended) The data recording method of ~~one of claims 1 to 6~~ claim 1, wherein in each said recording mark making period, the length of a period in which the write pulse waveform has a cooling power level Pc is set to be at least equal to 1 Tw.

8. (Currently amended) The data recording method of ~~one of claims 1 to 7~~ claim 1, wherein the start position of the first pulse, included in a recording mark making period of the write pulse waveform, and the end position of a cooling pulse, also included in the recording mark making period, are shifted according to the length x of a code associated with the recording mark making period.

9. (Original) The data recording method of claim 8, wherein the positions are shifted to at least four different degrees corresponding to the code lengths x of n, n+1, n+2 and n+3 or more.

10. (Currently amended) An apparatus for recording data as edge position information, including marks and spaces of multiple different lengths, on a storage medium by irradiating the storage medium with a pulsed energy beam, the apparatus comprising:

laser driving means for modulating the power of the energy beam;

coding means for converting the data to be recorded on the storage medium into ~~a write code sequence~~ an NRZI data; and

mark length classifying means for determining a write pulse waveform, defining the power modulation of the energy beam, according to the code lengths x of respective codes included in the ~~write code sequence~~ NRZI data,

wherein if the shortest code length of the ~~write code sequence~~ NRZI data is n (which is an integer equal to or greater than one), the mark length classifying means assigns a write pulse waveform that has only one write pulse Pw to recording mark making periods corresponding to codes with code lengths x of n, n+1 and n+2, and a write pulse waveform that has multiple write pulses Pw to recording mark making periods corresponding to codes with code lengths x of n+3 or more, respectively.

11. (Original) The apparatus of claim 10, wherein as to two codes, which have code lengths m and m+1, respectively, and which have the same number of write pulses Pw and the same number of periods with a bottom power level Pb between two write pulses Pw in the recording mark making period of their write pulse waveforms, the write pulse waveforms are determined so as to satisfy the inequality:

(pulse width of code length m) $\leqq$ (pulse width of code length m+1)

where the "pulse width of code length m" is an arbitrary Kth period with the bottom power level included in the recording mark making period corresponding to the code length m and the "pulse width of code length m+1" is the Kth period with the bottom power level included in the recording mark making period corresponding to the code length m+1.

12. (Currently amended) The apparatus of claim 11, wherein if the shortest code length of the ~~write code sequence~~ NRZI data is n (which is an integer equal to or greater than one), the code lengths x are classified into at least four lengths including n, n+1, n+2 and n+3 or more, and

wherein as to two codes, which have code lengths m and m+1, respectively, and which have the same number of write pulses Pw in the recording mark making period of their write pulse waveforms, the write pulse waveforms are determined so as to satisfy the inequality:

(write pulse width of code length m) $\leqq$ (write pulse width of code length m+1)

where the "write pulse width of code length m" is the width of an arbitrary Kth write pulse period included in the recording mark

making period corresponding to the code length m and the "write pulse width of code length m+1" is the width of the Kth write pulse period included in the recording mark making period corresponding to the code length m+1.

13. (Original) The apparatus of claim 11, wherein as to two codes, which have code lengths m and m+1, respectively, and which have the same number of write pulses Pw and the same number of periods with a bottom power level Pb between two write pulses Pw in the recording mark making period of their write pulse waveforms, the write pulse waveforms are determined so as to satisfy the inequality:

(pulse width of code length m) $\leqq$ (pulse width of code length m+1)

where the "pulse width of code length m" is the width of an arbitrary Kth period with the bottom power level Pb included in the recording mark making period corresponding to the code length m and the "pulse width of code length m+1" is the width of the Kth period with the bottom power level Pb included in the recording mark making period corresponding to the code length m+1.

14. (Original) The apparatus of claim 11, wherein the write pulse waveform in the recording mark making periods corresponding to

codes with code lengths x of n+3 or more is determined so as to include a number of write pulses that is equal to the quotient obtained by dividing (x-1) by two.

15. (Original) The apparatus of claim 11, wherein the write pulse waveforms are determined such that every interval between trailing and leading edges of a fundamental waveform of a laser pulse in the mark making periods becomes at least equal to a detection window width Tw.

16. (Original) The apparatus of claim 11, comprising pulse shifting means for shifting the start position of the first pulse, included in a recording mark making period of the write pulse waveform, and the end position of a cooling pulse, also included in the write pulse waveform, according to the length x of a code associated with the recording mark making period.

17. (Original) The apparatus of claim 16, comprising write compensating means for shifting the positions to at least four different degrees corresponding to the code lengths x of n, n+1, n+2 and n+3 or more.